

WHAT IS CLAIMED IS:

- 1 1. An apparatus for improving hearing, comprising:
2 a housing vibrationally couplable to a vibratory
3 structure of an ear; and
4 a mass mechanically coupled to the housing, wherein
5 the mass vibrates in direct response to an externally
6 generated electric signal;
7 whereby vibration of the mass causes inertial
8 vibration of the housing producing vibrations in the vibratory
 structure of the ear.
- 1 2. The apparatus of claim 1, further comprising a
 mounting mechanism that mounts the housing on the skull.
- 1 3. The apparatus of claim 2, wherein the mounting
 mechanism is a screw or bone cement.
- 1 4. The apparatus of claim 1, further comprising a
2 mouthpiece, the housing being incorporated into the mouthpiece
3 so that vibrations of the housing produce vibrations in the
 vibratory structure of the ear through at least one tooth.
- 1 5. The apparatus of claim 1, further comprising a
 mounting mechanism that mounts the housing on an ossicle.
- 1 6. The apparatus of claim 5, wherein the mounting
 mechanism is a clip, screw or adhesive.
- 1 7. The apparatus of claim 1, further comprising a
2 mounting mechanism that mounts the housing on a tympanic
 membrane, oval window or round window.
- 1 8. The apparatus of claim 7, wherein the mounting
 mechanism is a suture or adhesive.
- 1 9. The apparatus of claim 1, wherein the housing
 is a sealed cylinder.

1 10. The apparatus of claim 1, wherein the mass
includes a magnet which generates a first magnetic field.

1 11. The apparatus of claim 10, further comprising:
2 a coil secured to the housing; and
3 leads connected to the coil that deliver the signal
4 to the coil, the signal being an alternating current which
5 causes the coil to generate a second magnetic field;
6 wherein the first magnetic field interacts with the
second magnetic field to cause the magnet to vibrate.

1 12. An apparatus for improving hearing, comprising:
2 a housing vibrationally couplable to a skull of a
3 person; and
4 a mass mechanically coupled to the housing, wherein
5 the mass vibrates in direct response to an externally
6 generated electrical signal;
7 whereby vibration of the mass causes inertial
vibration of the housing producing vibrations in the skull.

1 13. The apparatus of claim 12, further comprising a
mounting mechanism that mounts the housing to the skull.

1 14. The apparatus of claim 13, wherein the mounting
mechanism is a screw, bone cement, peg or suture.

1 15. The apparatus of claim 14, wherein the mounting
2 mechanism mounts the housing to bone of the skull in a middle
ear of the person.

1 16. The apparatus of claim 12, further comprising a
2 mouthpiece, the housing being incorporated into the mouthpiece
3 so that vibrations of the housing produce vibrations in the
skull through at least one tooth of the person.

1 17. The apparatus of claim 12, wherein the housing
is a sealed cylinder.

1 18. The apparatus of claim 12, wherein the mass
includes a magnet which generates a first magnetic field.

1 19. The apparatus of claim 18, further comprising:
2 a coil secured to the housing; and
3 leads connected to the coil that deliver the signal
4 to the coil, the signal being an alternating current which
5 causes the coil to generate a second magnetic field;
6 wherein the first magnetic field interacts with the
second magnetic field to cause the magnet to vibrate.

1 20. A method of improving hearing, comprising the
2 steps of:

3 attaching a housing to a skull of a person, wherein
4 the housing is mechanically coupled to an inertial mass which
5 vibrates in response to an externally generated electrical
6 signal; and

7 connecting the housing to an external microphone
8 which produces the electrical signal in response to ambient sound.

1 21. The method of claim 20, wherein the housing is
2 attached to the skull by a mounting mechanism, wherein the
mounting mechanism is a screw, bone cement, peg or suture.

1 22. The method of claim 20, wherein the housing is
attached to bone of the skull in a middle ear of the person.

1 23. A hearing apparatus, comprising:
2 a mouthpiece;
3 a housing incorporated into the mouthpiece such that
4 the housing is vibrationally coupled to at least one tooth
5 when the mouthpiece is placed in the mouth of a person; and
6 a mass mechanically coupled to the housing, wherein
7 the mass vibrates in direct response to an externally
8 generated electrical signal;

9 whereby vibration of the mass causes inertial
10 vibration of the housing producing vibrations in a vibratory
 structure of the person through the at least one tooth.

1 24. The apparatus of claim 23, wherein the
 mouthpiece is a scuba mouthpiece.

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